

Application No.:10/072,362

Docket No.: CPH35726-D1-R

**REMARKS****Present Status of Patent Application**

Claims 10-15 remain pending of which claims 10-15 have been amended in to correct a minor typographical error. It is believed that no new matter adds by way of amendments to claims or otherwise to the application.

For at least for the following reasons, Applicant respectfully submits that claims 10-15 patently define over the prior art of record. Reconsideration is respectfully requested.

**Objection to Claims**

*The Office Action objected to claims 10-15 because of the following informalities and/or defects: In claims 10 and, the term "first and second trench" should read as -first and second trenches; and claims 10-15, the term "the thick insulating layer" should read as -thin insulating layer—according to the original specification. Appropriate correction is required.*

In response thereto, Applicants have amended claims 10-15. After entry of the above amendments to claims 10-15, it is believed that the above objections to claims 10-15 can be overcome. Reconsideration is respectfully requested.

**Response to Claims Rejections under 35 USC§103**

*The Office Action rejected claims 10-15 under 35 U.S.C. 103(a), as being unpatentable over Lancaster et al. (US-4,835,584, hereinafter Lancaster) in view of Lee et al. (US-4,685,196, hereinafter Lee) and or Solomon et al. (US-5,108,938, hereinafter Solomon).*

Applicants respectfully disagree and traverse the above rejections as follows. Applicants respectfully submit that independent claims 10 and 13 are allowable for at least the reason that

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Lancaster, Lee and Solomon substantially fails to teach, suggest or disclose a MOSFET device comprising at least "a gate electrode comprising a first vertical portion, a second vertical portion and a horizontal portion, wherein the first vertical portion is embedded inside the first trench and said thin insulating layer and said first vertical portion within the first trench completely fills the first trench, the second vertical portion is embedded inside the second trench and said thin insulating layer and said second vertical portion within the second trench completely fills the second trench, and the horizontal portion is disposed over the substrate and connects said first and second vertical portions together" as required by the claims 10 and 13". The advantage of the above structure is that at least the above gate structure can be fabricated from a more simplified method. Further, the effective width of the gate can be effectively increased by  $2nt$  while at the same time the lateral surface occupation of the gate can also be effectively reduced and thereby allowing further increase in the integration of the semiconductor device.

Instead, Lancaster, in FIG. 4, 5A-5L, 6 and 7A-7F, and related texts, substantially discloses two different methods of fabricating a MOSFET including a trench electrode 58. Particularly, the final structures of the MOSFETs fabricated in the two different fabrication processes are shown at FIG. 5L and FIG. 6 respectively. As shown in the intermediate steps shown at FIG. 5J-5K that the gate layer 58 is patterned to form the trench gate 58 and a dielectric filler layer 70 is formed on the trench gate 58 as shown in FIG. 5K, and therefore, it is clearly evident that the structure of the MOSFET of Lancaster lacks at least a horizontal portion of the gate that is disposed over the substrate connecting the first and second vertical portions disposed in the first and second trenches together respectively. Furthermore, the final structure of the MOSFET of Lancaster shown in FIG.

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6 fabricated by another process (FIG. 7A-7F) also clearly lacks the horizontal portion of the gate that is disposed over the substrate connecting the first and second vertical portions disposed in the first and second trenches together respectively.

Furthermore, Applicants similarly submit that both Lee and Solomon also substantially fail to teach, suggest or hint at least a horizontal portion of the gate that is disposed over the substrate connecting the first and second vertical portions disposed in the first and second trenches together respectively.

Thus, Applicants respectfully submit that Lancaster, Lee and Solomon either alone or in combination cannot possibly to teach, suggest or disclose every features of the claimed invention in this regard.

For at least the foregoing reasons, Applicants respectfully submit Claims 10-15 patently define over Lancaster, Lee and Solomon. Reconsideration is respectfully requested.

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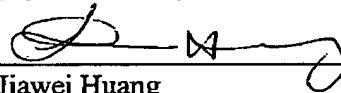
**CONCLUSION**

For at least the foregoing reasons, it is believed that all pending claims 10-15 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Date: 1/17/2006

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Respectfully submitted,  
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